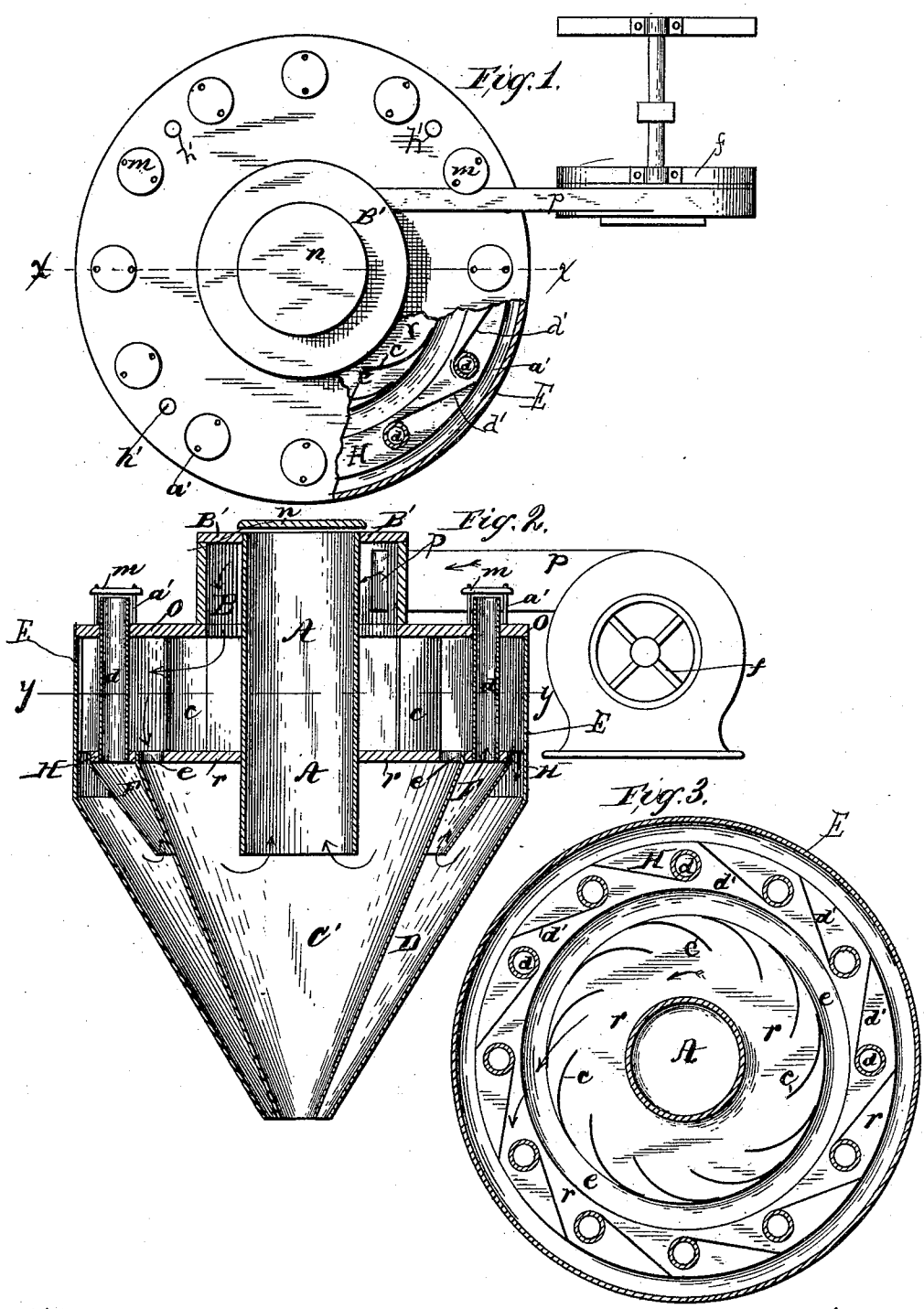


(No Model.)

E. BRETNEY.
DUST COLLECTOR.

No. 397,048.

Patented Jan. 29, 1889.



Witnesses
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UNITED STATES PATENT OFFICE.

EUGENE BRETNEY, OF INDIANAPOLIS, INDIANA, ASSIGNOR TO THE BRETNEY DUST COLLECTOR COMPANY, OF SAME PLACE.

DUST-COLLECTOR.

SPECIFICATION forming part of Letters Patent No. 397,048, dated January 29, 1889.

Application filed March 23, 1887. Serial No. 232,205. (No model.)

To all whom it may concern:

Be it known that I, EUGENE BRETNEY, a citizen of the United States, residing in the city of Indianapolis, county of Marion, and State of Indiana, have invented certain new and useful Improvements in Dust-Collectors; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to machines for collecting dust and assorting the same according to the specific gravity of the particles forming the dust, and is adapted for use in flour and other mills; and it has for its object to provide a simple, durable, and inexpensive device whereby a current of dust-laden air may be purified in the most thorough manner in one machine or during one treatment; and it consists of the parts and combinations of parts hereinafter described and claimed.

In the accompanying drawings, forming a part of this specification, Figure 1 is a plan view of my machine, partly broken away to show the interior; Fig. 2, a vertical section on the line *x x*, Fig. 1; and Fig. 3, a horizontal section on the line *y y*, Fig. 2.

Similar letters refer to similar parts throughout the several views.

E represents a cylindrical shell and D an inverted conical shell, the upper end of which is hermetically secured to the lower end of the shell E. The upper end of shell E is provided with an air-tight cover or head, O, having a central opening, over which or to the edge of which the lower end of a cylinder, B, is secured in such manner as to prevent the escape of air at the point of connection. This cylinder B is also provided with an air-tight cover or head, B', having a central opening, through which passes and to which is secured a tube or cylinder, A, the upper end of which is provided with a valve, *n*, whereby the passage of the air through the tube may be regulated.

At a slight distance above the lower edge of shell E and within the same a dividing par-

tion or ring, *r*, is secured in the manner hereinafter described, through which the tube or cylinder A extends, the ring and cylinder being connected so as to form an air-tight joint. Between the ring *r* and the cover O of the shell E a series of curved deflectors, *c*, are secured obliquely in a circular line about the cylinder A, but at a distance therefrom—that is, the inner edges of the deflectors terminate on a line with the wall of the cylinder B and are secured at their upper ends to the cover O and at their lower ends to ring *r*, thus supporting said ring.

Within the conical shell D an inverted conical shell, C', is secured by attaching it at its upper end to the inner edge of the ring H, thus forming a chamber for the dust-laden air-current, which passes through the opening *e*. A short conical shell, F, surrounds the shell C', and is secured at its upper end to the outer edge or periphery of the ring H, the purpose of which shell will be explained hereinafter. Said ring H is secured to the cover O in any suitable manner (bolts *h'* being indicated) in position to form an annular opening, *e*, between its inner edge and the outer edge of the ring *r* and a similar opening between its outer edge and the casing E. In said ring H a number of openings are made, through which and corresponding openings formed in the cover O a series of tubes, *d*, having valves *m* at their upper ends, are passed. At the side of each of these a deflector, *d'*, is mounted and extends out at an angle corresponding substantially in direction to the angle of the deflectors *c*.

All three of the conical shells are open at their lower ends, and shells C' and D terminate on a line or level with each other, and may be provided with any suitable devices to convey away the collected dust, while the shell F terminates at a short distance below the upper end of conical shell C', the tubes *d* being located immediately above and opening into said shell F.

An opening is formed in the side of cylinder B, to which is fitted a spout, *p*, said spout being connected with the machine from which the dust is drawn, and it may be provided

with the fan *f* to create the draft or accelerate the current of dust-laden air passing through the spout.

The valves *m* of the spouts *d* may be provided with any suitable device, whereby they may be adjusted, and in Figs. 1 and 2 I have shown posts or guides *a'* secured to and projecting from the cover O alongside the tubes, and passing through holes in the valves, on which the valves *m* may slide up or down to increase or decrease the openings for the escape of air through the tubes.

All the deflectors and tubes are constructed of tin or other suitable material, and it is evident that the tubes and deflectors *d'* may be made of one piece in the form of flat or curved tubes, instead of round; but I deem the construction first described as preferable.

In operation the current of dust-laden air is forced through the spout *p* into the chamber formed by the cylinder B, and, impinging against the wall of the same, is given a whirling or rotary and downward movement therein and around the tube A until the chamber formed by or space between the tube A and the deflectors *c* is reached, where the air is deflected outwardly—still on a curved or circular line—to the space or chamber between the outer edges of the deflectors *c* and the inner edges of the deflectors *d'*, where a part of the air carrying the heavier particles of dust escapes through the opening *e* into the chamber formed by the inner conical shell, C', the dust and air still maintaining the rotary impetus which they have received around the inner surface of the shell C' until the gradual contraction of the chamber turns the air upward and through the tube A, while the dust maintains its course down the wall of the chamber to the outlet. Such part of the current of air as passes over the opening *e* finds its way through the interstices of the deflectors *d'* and impinges against the wall of the chamber formed by the shell E. This portion of the current carries the lighter particles of dust and receives the same rotary impetus around the inner wall of the shell E, the dust and current of air escaping from the chamber formed by the wall of the shell and the deflectors *d'* at the outlet formed by the outer edge of ring H and the wall of the shell E into the outer conical chamber, D, where the same whirling movement of the air-current and dust is maintained. The air-current, finally turning upwardly and passing through the conical shell F, enters the tubes *d*, and thus passes out of the machine purified, while the dust follows the inner surface of shell D down to the outlet, where it, as well as the dust from the shell C', may enter suitable receptacles therefor.

It will be readily seen that in the above operation a rotary impetus is given the air-current by the cylinder B and tube A, and that it is separated by expansion into successive chambers having outlets through their bottoms, and that in such a current the lighter

particles are borne on top and the heavier particles seek the bottom, and that consequently the separations may be extended indefinitely by forming other air-chambers around, and similar to those described, supplied with vents for the air and receptacles for the dust corresponding to the air-tubes and funnels above described, and I do not, therefore, desire to be limited to any particular number of chambers and funnels.

In making a great number of separations of the dust particles the escape of the air should be regulated by the valves *m* and *n*, so that the force of the current will not be expended before reaching the outer chamber.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. The combination, in a dust-collector, of a main cylindrical chamber having a series of deflectors and tubes arranged in circular lines within said chamber, partitions or rings forming the bottom of the chamber, conical shells secured to the lower edge of said chamber and said rings, said shells being located one within the other, a tube concentric therewith, having a valve at its upper end, a cylindrical chamber surrounding the upper portion of said tube and having its lower edge attached to the top of the main chamber, and an air-spout leading into the same, substantially as described.

2. In a dust-collector, the combination of the inclosed cylindrical casing E, formed with an air-inlet, the tube A, concentric therewith, a bottom to said casing provided with a series of annular openings, a series of deflectors arranged in circles between said annular openings above said bottom, and the series of conical shells with open bottoms secured to the edge and bottom of said casing E, substantially as set forth.

3. In a dust-collector, the combination of a main separating-chamber, and a cylindrical separating-chamber secured above the same and communicating therewith and provided with a pure-air escape-tube, having an opening and closing cover or valve.

4. The combination, in a dust-collector, of the casing E, provided with the cover O, having a central opening, the casing B, arranged above said opening and provided with the cover B', and an air-inlet, the bottom of said casing composed of the rings *r* and H, the tube A, extending through said cover B' and said bottom, the series of deflectors *c*, arranged on the ring *r*, the series of deflectors *d'* on the ring H, the tubes *d*, extending up through said ring H and the cover O, and the series of conical shells D, C', and F, formed with discharge-openings secured to the lower edge of said casing E and to the rings forming its bottom, substantially as set forth.

5. The combination, in a dust-collector, of

the main cylindrical casing E, provided with
an air-inlet, the bottom therefor being com-
posed of rings leaving annular openings,
the series of deflectors above said bottom,
5 and conical shells with open bottoms below
said bottom, forming separating-chambers,
and pure-air-escape tubes extending from

each separating-chamber out through the
machine, substantially as set forth.

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Witnesses:

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